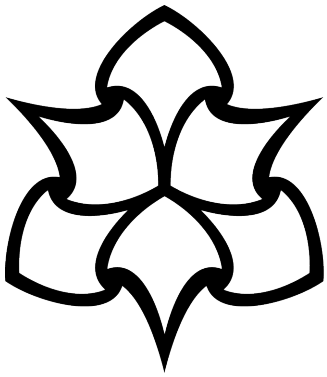

What is the influence of low back pain on muscle activity and movement during a cyclical dynamic task?

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Introduction: Low back pain (LBP) is a leading cause of disability. High-density electromyography (HDEMG) has revealed differences in the spatial distribution of back muscle activity during movements. However, these studies have only considered a small portion of the erector spinae (ES) during tasks which were either static or mono-planar.

Methods: This study combines HDEMG and kinematic analysis to investigate the effect of LBP on the spatial distribution of ES activity during a dynamic lifting task. Sixteen people with chronic LBP (8 male, age: 26.9 ± 10.8 years) and 16 age and gender-matched controls (7 male, age: 31.7 ± 14.0 years) completed the study. HDEMG signals from the ES were detected bilaterally by four 64-channel semi-disposable 13 × 5 electrode grids. Kinematic surface markers were placed over the back in triangular arrangements, creating lumbar and thoracic segments to track movement. HDEMG and kinematic data were recorded continuously during a dynamic task involving the cyclical lifting of a 5 kg box between 6 shelves for 10 cycles (~7 minutes). The shelves were arranged around the participant, at knee and sternal height.

Results: Data analysis is underway; with full results presented at the conference.

Conclusions: This study will impact on our understanding of neuromuscular adaptations to LBP during functional activity.